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ABSTRACT

This issue consists of four papers which have an orientation towards the student's perspective. The first paper, "CSU Distance Students' Attitudes toward Computer Use" (Helen Geissinger), presents the results of a survey which examined students' responses to the use of computers in their courses and their attitudes to the more frequent use of computers in the future. The second paper, "A Student's Perception of Distance Education: Implications for the Continuing Professional Education of Academics" (Basseer Jeewody), presents a personal reflection on distance education based on the author's experience as a student at the Open University (United Kingdom) and as an academic at Charles Sturt University (Australia) with responsibilities in program planning and implementation. In the third paper, "Rationalisation--A Case Study. 'Is Bigger Better?'" (Terry Harden and Sue Davies), data are presented on the modularization and rationalization of first year microbiology, based on questionnaire data obtained from internal and distance students. The final paper, "Literature Review Related to Style Issues" (Jill Harris), reviews the literature which examines how specific layout features can be used to enhance learning in distance and open learning materials. (Contains 28 references overall.) (MES)

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OCCASIONAL PAPERS
IN
OPEN AND DISTANCE LEARNING

NUMBER 15

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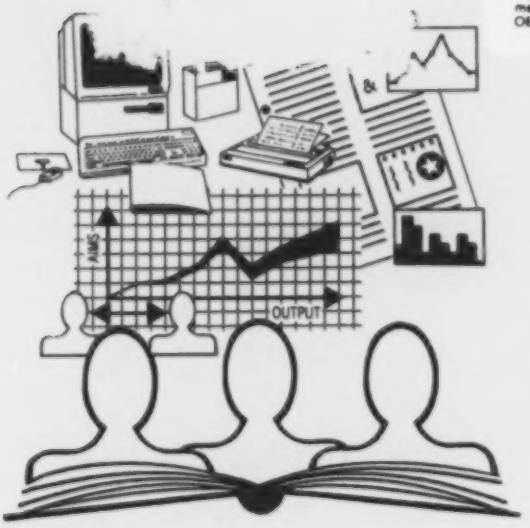

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Occasional Papers

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EDITORIAL COMMENT

This issue of *Occasional Papers in Open and Distance Learning* consists of four papers which have an orientation towards the student's perspective, an appropriate theme in this period of quality concerns in higher education.

The first paper by Helen Geissinger focusses on students' concerns and attitudes towards computers at a time when there is a proliferation of new technologies in distance education. It is the type of undramatic, grassroots study that a distance institution needs to conduct amongst its own students to gather data about how they are basically affected or are likely to be affected by advancing technology.

The second paper by Basseer Jeeawody is a reflection on distance education which links two worlds: the author's experience of being a distance student at the Open University (U.K.) for six years and his present postion as an academic responsible for program planning and implementation. The paper is imbued with a consistently argued conviction that being fully conversant with students' needs is an essential aspect of distance education and that, furthermore, this has implications for the continuing professional education of academics.

In the third paper Terry Harden and Sue Davies present a sequel to an earlier study of CSU's ongoing experience with modularisation and rationalisation of a first year subject. Using data obtained from student questionnaires they detail the return to smaller offerings of the subject after assessing the advantages and disadvantages.

The final paper by Jill Harris surveys the literature on the impact of layout styles on learning and distance education; it concludes that although many writers consider the use of particular styles a matter of personal choice, there is a body of research which is well worth consulting.

Subsequent issues of *Occasional Papers in Open and Distance Learning* will be jointly edited by Anne McDonald and Peter Donnan. Anne is an instructional designer with the Open Learning Institute and I would like to welcome her to the editorial team. I would like to thank Anne for her assistance in helping to prepare this edition and also acknowledge Boyd Bickett's new cover design.

Peter Donnan
Editor

A CALL FOR PAPERS

Looking ahead to the next issue of *Occasional Papers in Open and Distance Learning*, I would like to invite papers from CSU staff which focus on quality issues in distance education. Of particular interest will be innovations that have improved the quality of teaching and learning. Riverina campus Education lecturer, Doug Hill, for instance, has written to the editor presenting a case for an external reviewer in distance education and part of his case is summarised below:

> 'The notion of a 'package/subject team' which is a feature of the Open University (U.K.), has not developed at CSU. There seem to be two main reasons for this viz:
>
> - in many cases it is not seen to be efficient to use a small team of academics when an individual can do the job.
> - often the individual given the task of developing the material is the best person or the only qualified person in that area.
>
> I find that although many staff in the Faculty of Education have some interest and expertise in the field of educational evaluation this is not an area which they find attractive and one in which they would like to work. This results in a degree of professional isolation in my case. I have to look outside the institution for discussion of recent developments, critical issues and emerging trends.
>
> In the last five years I have developed a 4th year BEd subject in Assessment and Evaluation, an MEd subject in Educational Evaluation and currently I am working in relative isolation, on an EdD subject in this area.
>
> Students are justly critical of authors who:
>
> - repeat the same material at several levels
> - do not present a balanced representative view of developments in the area
> - fail to keep abreast of the literature and emerging issues and concerns
> - present material in a boring/difficult way.
> - neglect to meet the reader's needs for relevance and context.
>
> These five demands are all difficult to meet by a professionally isolated academic. I sought advice from colleagues who faced similar difficulties in their particular area. The best piece of advice seemed to be to identify someone else whose advice you would value and to contact them to seek help. In my case I identified Dr Nigel Norris at the Centre for Applied Research in Eduction (CARE) at the University of East Anglia.

> The selection was easy - he had written the text I had used for the MEd subject, Educational Evaluation, he had published widely in the field and was a member of a respected research team.
>
> I wrote to Dr Norris and described my situation and asked if he would review the MEd mail package I had written. I received a positive reply. Soon after I had posted the materials I was granted SSP leave. I included a visit to CARE in my itinerary and was able to sit down with Nigel and review the package in detail. This has been a great help in revising that material.
>
> Dr Norris also assisted me in identifying some key issues and design features for the EdD package on which I am currently working.
>
> I have found the above process valuable and professionally rewarding and intend to use feedback from an external reviewer and from students in helping to maintain good quality materials. I commend it to other academics'.

Doug Hill's account may resonate with staff who have introduced successful innovations; alternatively, there may be other staff who have received funding for special projects and may like to use this forum to describe the processes they have use to enhance quality educational outcomes. Charles Sturt University staff wishing to address quality issues in open and distance learning are invited to submit a copy of any material for publication in the next edition.

Please forward papers to:

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CSU DISTANCE STUDENTS' ATTITUDE TOWARD COMPUTER USE

Helen Geissinger
Formerly with the Open Learning Institute

This paper presents the results of a survey which examined students' responses to the use of computers in their courses and their attitudes to the more frequent use of computers in the future.

THE SURVEY

A postal survey of distance students was conducted during the month of September, 1993, using a questionnaire of 15 items. The questions dealt with students' present use of computers and their attitudes toward a suggestion of regular use of the computer for accessing CSU teaching/learning resources in the future.

A random stratified sample of 500 student names was obtained from CSU Computer Services, Bathurst. The students in the sample are all currently registered in courses at CSU and are studying by distance education. Half are in courses which require regular computer use, such as business and information technology. The other half are in courses which do not require regular computer use, such as arts and primary school teacher education. In addition, there was a 50:50 split of female:male students.

There was a 54% return of the questionnaires. The questionnaire evidently touched on some issues the students had been thinking about. Although many of the questions only required a circle or checkmark to be placed on a suitable given response, the students wrote their opinions about the particular issue in the margins, usually as an additional comment to expand on the response they chose. The sample was not stratified according to geographical location. Of the responses, 70% were from students living in cities and towns, with 20% from students living within 100 km of a city and 10% from those outside the 100 km radius. These returns help give a picture of computer equipment rural students now own, compared with city students.

SOME FINDINGS

Due to a lack of time between receipt of the returned questionnaires and the present, a complete summary of the results is not yet available. Some of the findings to date are

very interesting. For example, 78% of respondents have a home computer. Of those who do not, the gender split is about 50:50, unlike the findings of some other authors, who found that more women students than men were without a home computer. Most people in this 'have not' group do have occasional access to a computer elsewhere; they agreed that they could do occasional assignments or projects on this computer, but some noted that they would be unable to do so on a regular basis. This last group comprised less than 3% of the 'have nots'. An additional 1% (most of whom are rural) stressed that they did not expect to have a home computer nor sufficient access to someone else's to be able to do assignments on it. They warned that they would be most upset with CSU if computer usage should become a required feature of the courses in which they are enrolled.

Of those who own a home computer, most have an IBM-compatible (a 286 or lower computing capability). Some own Apples and Macintoshes and a very few own Amstrads, Ataris, and Commodore CPMs. The most common printer is a dot matrix; some students own a laser or an inkjet. Twenty percent own modems; a few of these are fax/modems, while the majority operate at 1200 baud maximum. Very few mention the ownership of other equipment, but some do own scanners, sound cards and CD-ROM readers. About one quarter of the total number of respondents use a modem (either at work or at home), but 87% of those surveyed expressed willingness to use one, if they had the opportunity. They thought the modem would be useful to submit their assignments and allow them to access library catalogues.

Almost all of the respondents are working and most of these use a computer at work. One percent said they are not working. Most mention inability to access a computer anywhere on a regular basis and say they are not sure of their computer skills. Obviously, this small group has particular needs and a lack of access to resources compared with other groups.

Some love their modem; some don't

Of the 13% of respondents who said they are unwilling to use a modem for coursework, most are experienced users who identified problems they have already encountered. They note that the equipment and/or the protocols do not work well and that they cannot access help when they need it. These remarks were made in reference to their experiences with modems, whether at work or at home. Evidently modems in the workplace have some problems in common with those connected to home computers. One irate respondent complained that access to CSU is hard to achieve from his rural area and that, once achieved, the line is apt to go down while he is actually sending data. A number complain about line charges and note their need to buy a faster modem if they were to send data on a regular basis.

If they had a modem, a large number of respondents agreed that they would want to use it to access library catalogues. Some of the 'unwilling' ones mentioned again the problems they had already had with modem access to CSU and did not want to be required to use a modem for transactions they now carry out by telephone and/or fax. A large number of willing respondents would like to access their instructors by modem, but are not interested in reaching CSU administrative services or the

university handbooks that way. They would like to have tutorials and the ability to submit assignments on-line. They are relatively unenthusiastic about contact with other students by modem, but then, very few subjects delivered by distance presently require group work on projects or assignments. If this requirement comes about, the number of student complaints about line charges is likely to rise noticeably, unless steps to ameliorate this problem are taken in advance.

A question about software elicited a divided response. Although 80% expressed willingness to learn new software, a number complained about the time needed to learn programs which they only used for one or a few subject(s). They preferred to buy, and spend their scarce time learning, good quality software which they would expect to use in a work situation. A number of education students indicated that their experience with computers was gained at the school where they were employed and the software they learned was related to school applications. Since Apples and Macintoshes are used in many schools, the level of interest and experience which has been indicated may be true for a broader range of teachers than just those in this study. As more software become available which translates MS-DOS and Apple/Mac files back and forth, the access to Apple/Mac equipment only may not be a problem to CSU distance students - as long as the computers they use have enough capability to handle the translation software.

In general, an enthusiastic response was given to a question about respondents' willingness to use computers for coursework as a requirement. Most replies were along the following lines: 'It is the only way to go', 'I...feel that any computer-based education would be a great step forward -- and I feel that I am in the generation thought to be computer 'unfriendly', 'It's a good idea. Should bring (distance) education into C21' and 'Computers (are) becoming more user friendly and high profile in the workplace. A good knowledge of their capabilities enhances job prospects...' (Arts student).

STUDENT CONCERNS

Although most students expressed good will about the use of computers, many qualified these remarks with specific worries. They noted the amount of time needed at the beginning of a subject to learn software well enough to do their coursework properly, their unwillingness to read large amounts of material from a computer screen, and the on-going expenses involved in buying sufficient memory and computing capacity to handle the latest software that might be a required part of a course. An example of that kind of response was given by an education student: 'Terrific idea but limited, because of expense if I had to purchase a printer, modem, etc.'

There were also complaints about the quality of instructional media already sent out on diskettes. A Commerce student found that 'disks from lecturers were poorly laid out, time consuming and frustrating'. Another wanted some way to add his own notes to the diskette sent to him, but could not discover how to do that. Students often wanted to print out certain parts of the information on the diskette for study while they travelled to work. They found that process to be difficult, if not

impossible for their computer equipment and expressed deep frustration. In addition, many students, while noting that they have good quality computer equipment of their own, expressed a concern for other students they thought might be disadvantaged if CSU was to require the use of computer equipment for doing coursework and accessing CSU. One respondent stated, 'I feel computers are not available to all students so these people should *not* be discriminated against', while another said '...levelling the playing field will be an interesting task!'. He presumably meant that the problems which may arise if computer usage becomes a requirement will be the responsibility of CSU, not the students.

A Commerce student noted, 'It is a good idea, but much consideration needs to be given to the limitations of correspondence students in relation to both accessing and knowledge of computers.' This respondent underlined two of the problems which worry students about the possibility of CSU establishing computer use as a prerequisite: on-line access and the development of adequate computer skills.

Skill levels and the need for help

About 30% of those who said they use a computer at home, at work, or in both places expressed unease with the level of their skills. This may be partly due to the fact that this group do not use the computer frequently. Most of them use it several times a month (out of four use categories: (a) several times a week, (b) several times a month, (c)very seldom and (d) never). This group shows how the student population's skills and attitudes are shifting. Research conducted five years ago showed that few students owned a home computer and that a larger group had rudimentary computer skills. Now 90% have a home computer and the group admitting to computer use but with low-level skills is fairly small.

They attribute their lack of skill to several causes. One is lack of instruction, e.g. 'I did Adv. Stats last semester using FACOM. We were given very little instruction (for external students) but were expected to be able to use the system.' Another said, 'I have little knowledge and experience in computers (and) am by no means an 'expert with one'. One education student wrote, '...feel a little inadequate at present but, as in all things, a few instructional weekends would...be beneficial!' while another said, 'Would require input on correct usage and understanding. I would hate it to be assumed that because I have a computer, I am capable of doing everything!' There were requests such as this: 'Proper examples and 'How tos' would be a must.' and 'Clear instructions should accompany subject notes to avoid wasting time.' A student put her finger on a problem which bothered many: 'Unless the uni could provide some technical backup service, I feel using the modem would cause people too many problems with their computer equipment.'

TIME, MONEY AND ACCESS

Another problem is infrequent access. An Arts student provided an example: '...I don't own a computer, but have access to one at work...after business hours as this is the only time I can gain access...I am nervous and hesitant about using them in any

advanced capacity...but am always willing to learn.' Another student has both access and cost problems, e.g. 'I don't have regular access to a computer and not being employed, the cost of software purchases, etc. would limit how I would use them. I would need instruction and have a person to call upon to assist my using this in relation to my course'.

Some respondents were doubtful about the large investment of their time needed to develop adequate computer skills when most of their subjects do not require computer use. They wanted a stronger rationale for the use of the computer and noted that some lecturers might use 'computers for the sake of computers' (Commerce student). A second Commerce student stated, 'Essential work should be relevant and useful, not just because computer content is demanded.' In addition to concerns over the time needed to learn new software and the relevancy of the software to future needs, many students expressed opinions about expense: '...financially it is not an expense I wish to have at present...', '...my PC is pretty sick and I can't afford to get it looked at.', and '...it is an obvious step forward, providing *costs* to students do not markedly increase.' One who has probably solved her money problem wrote, 'It's a great idea. I only wish my tax cheque would come so I could get mine.'

SUMMARY

In general, the respondents felt very positive about computer usage for their courses and expressed many hopes that CSU would produce supportive computer materials and protocols which would enable easy access to content and to CSU. They said, (It's a) much more professional approach to study, utilizing technology', 'It is inevitable, so the sooner the better. (We need) an efficient communication system that could be used for a number of purposes', and 'It's a great idea...it could ease people's worry about using the equipment, e.g. modems) if CSU provided instruction on how to use the equipment.'

But all is not sunny in the CSU sky. One male student in his forties wrote, 'Who, me? You've got to be kidding!' A response like that indicates to faculty at CSU wishing to use computers more frequently for distance education that easing students into computer technology is an important task. If instruction can be given in the use of the equipment, and access to CSU by modem can be made easy, student feedback should be quite different. Perhaps the next survey will mainly elicit responses about the successful achievement of students' goals.

A STUDENT'S PERCEPTION OF DISTANCE EDUCATION : IMPLICATIONS FOR THE CONTINUING PROFESSIONAL EDUCATION OF ACADEMICS.

Basseer Jeeawody

Faculty of Health Studies

ABSTRACT

This paper presents a personal reflection on distance education based on my earlier experience as a student at the Open University (U.K.) and now as an academic at Charles Sturt University with responsibilities in program planning and implementation. My views on distance education have also been influenced by discussions with students and colleagues as well as by my own professional reading in the area. The need for continuing professional education is explored in relation to distance education student's learning processes generally, the importance of orientation material, access to information and resources, technology and interaction, the role of tutor counsellors and student support systems.

INTRODUCTION

I became interested in nursing education in 1975 . To become qualified as a health professional I successfully completed a clinical teachers' course, a post graduate certificate in education and the University of London Diploma in Nursing. I then enrolled in a degree course through the Open University (U.K.) and after six years of study in the distance mode, I successfully completed a Bachelor of Arts (Honours) in psychology.

My current position as a senior lecturer within the Faculty of Health Studies at CSU-Riverina provides me with an opportunity to reflect on my experiences as an external student. I believe that being fully conversant with students' needs is an essential aspect of distance education. An understanding of students' views, attitudes, learning methods and responses to learning materials is almost a prerequisite to be involved in planning, promoting and implementing this mode of education. This paper reflects on the effectiveness of distance education from a students' viewpoint, in the belief that this perspective is of value to anyone developing distance education course materials.

Student Characteristics

> Ideal - typically, the traditional university student, is between 18-24 years and arrives at university directly from high schools. They have limited knowledge of the real world of work and hardly have long term personal relationships such as marriage or the responsibilities for children. University for them is often an extension of high school. They interact with other similar individuals, and share with them similar experiences. There is common bond necessity by the similarities of their age cohort and lack of divergent experience. They are integrated socially and, as they progress through the higher educational system, their social perspective become ever more similar. They share similar values and outlooks on life. They become 'university-types'. Their perception and self image and behaviour reflect this socialization.'

> Contrasted to younger students, adult students have by definition experience with work life and often have experience with long term relationships, raising children, and involvement in community activities. They rarely enter the higher education process directly from high school. They are not a unified cohort of limited age range. As a result of the variety of backgrounds they form a heterogeneous group. There, where the main social bonds of the adult education student are likely to be within their social context outside of the educational institution in the 'real world'.

Hotchkis (1992:204-205)

Generally distance education students in my experience are adults whose lives are fairly well structured around family, social/community and work responsibilities. The additional responsibility of study disrupts such a settled routine because students have to reorganise their lives to fit in with their selected studies. If the organisation of their studies is rigidly structured, this may create a variety of constraints. More flexible courses introduce a higher degree of freedom and hence reduce attrition rates. It is important to bear in mind that students require flexibility in order to work around their established commitments. Study options, including opportunities to undertake a full or reduced load, encourage them to select courses related to their capabilities. Students with such wide reponsibilities have to face major events in their personal and career lives.

Distance students generally suffer from academic isolation and they appreciate the opportunity to interact with their assigned lecturers and with other students. They recognise lecturers who make themselves available and who display positive, supportive attitudes. Student self-helf groups are also a source of support but a great deal of perseverence is often required to establish these because of geographical locations. If students' needs to interact are met a great sense of rapport is experienced; on the other hand, if students can not surmount the difficulties and

establish relationships, they tend to suffer in silence rather than demonstrate their inadequacies.

Students who complete their studies develop maturity and decision making skills. Distance education courses require them to exercise a high degree of choice and control as their study progresses. Bailey (1992) states that distance education can demonstrably create new opportunities, not only in practical and spatial terms but also in its pedagogies, technologies and learning styles. Learners can be given more control over what and how they learn, as well as when and where.

Distance education also creates constraints and many difficulties for students. Bailey (1992:984) continues:

> Industrialised models of material production, distance study, interactive technologies and relatively open-ended schedules can all create difficulties for the learner. These difficulties include isolation, a legacy of inappropriate, traditonal learning styles, underdeveloped study skills, fear of failure, lack of feedback and opportunities to test and confirm new knowledge and - inevitably with adult students- blocks to progress caused by life events and multiple roles.

Whether students withdraw early from courses or continue until course completion, their needs should be carefully considered in all circumstances and options made available to them. Different strategies for enhancing motivation should be considered. Holmberg (1985) argues that distance education will support student motivation, promote learning pleasure and effectiveness if it:

- is felt to make the study relevant to the individual and his/her needs;
- creates feelings of rapport between the learner and the distance education institution's personnel;
- facilitates access to course content;
- engages the learner in activities, discussion and decision; and
- caters for helpful, real and stimulated conversation to and from the learner.

Dropout or attrition in distance education is an issue which academics need to address. An understanding of the characteristics of good quality courses, and what is involved in their design and promotion, helps to reduce dropout. Specific research is required on student needs, and the measurement of their success and satisfaction. Positive reinforcement which acts as a catalyst towards the successful completion of studies and intermediary support should also be explored. Successful completion of courses can be one of the greatest events in students' lives and therefore formal and public acknowledgement of this success should be valued.

IMPORTANCE OF ORIENTATION

When students are deciding to embark on distance education study they are often reflecting on their past experience and future perceived needs and this encompasses the possibility of a change in career direction. They require consistent assistance and guidance from distance institutions, especially in relation to specific courses and what

is on offer. The responsibility of the educational institution is to make provision for relevant information and initiate contact. Administrative details should be clarified. At this stage contact with a course advisor on a personal level becomes advisably essential. Students need to be able to talk to a good listener and be assisted in clarifying their aspirations. The provision of student support programs is an integral component of the delivery of distance courses.

Orientation programs are a positive way of commencing distance education courses. Bowser and Race (1991) surveyed students attending orientation programs and found that what students valued most highly was meeting other students although clarification of academic, administrative and enrolment matters was also highly rated. Programs which bring new and old students together and incorporate a social dimension are especially appreciated. As academics and administrators we need to be aware that students enrol in the distance mode because of isolation from the institution. Dekkers, Kelly and Sharma (1988) have supported this theory through their observation of distance students' desire to access institutional pesonnel, the most prominent being the lecturing staff. They also observe that many students seek opportunities to meet with other students and this is in accordance with my own experience at the Open University.

Orientation programs are commonly offered by distance institutions but they do not always serve their purposes. Bowser and Race (1991) have observed that many of these programs are not formally evaluated and that greater research should be conducted into actual student's needs. As academics and administrators, we need to reflect on these observations and respond to the challenge for continuing professional enhancement. In addition to placing emphasis on academic and course information, a student orientation perspective needs to be emphasised. This means addressing all apects of students' needs, including study skills, clarification of administrative procedures and effective use of computers for instance.

In summary this approach means focussing on the objectives of the orientation program to ensure that it is an enabling and motivational process. It should provide experiences which assist students in identifying with the institution and, as Bowser and Race (1991) state, 'resolving before the start of the academic year any administrative or academic problems they have'.

Students' styles of learning

Distance students display a considerable range of learning styles: some adopt a holist strategy and relate the subject matter to real life and personal experience; others use a serialist approach which builds an understanding when detailed information in logical steps is available. Deep learners seek to study material in a critical manner searching for meaning and relationships; in contrast, surface learners process material in a shallow style often trying to remember details using rote-learning methods.

Students are influenced by personal, vocational and academic orientations. Marland et al. (1981) observed that students have either Theory X or Theory Y orientation (illustrated in table 1). In the majority of instances, the learning process of distance

education students is equally course and interest orientated and in such circumstances the learning process is dynamic and a flexible approach is adopted. In the table there is a recognition that orientation and methods of study are influenced by major constraints. There is usually inadequate time for study and the satisficing learner particularly will adopt time saving and time efficient strategies. The table also presents the importance of motivation within a distance education perspective.

Table 1: Outlines of Study Orientations
(Marland, P. *et al.*, 1984).

CHARACTERISTICS	STUDY ORIENTATIONS	
	X	Y
Motivation	**Intrinsic, Professional** - Improve teaching - Improve self knowledge - Develop understanding of teaching - Get more out of course - Put more effort into course (not concerned with grades)	**Extrinsic** - Obtain graduate qualifications - Achieve higher status - Get salary increment - Enhance employment prospects
Study Strategies	**Optimising** - Read beyond course materials - Process material three times - Generate own questions - Use textual material to evaluate own teaching whenever appropriate or interested	**Satisficing** - Select textual material for study that is relevant to assessment - Process material once - Complete minimum requirements - Use textual material to evaluate own teaching when required - Evaluate when required
Student Role	- Diverge from assigned or implied student role where necessary, appropriate	- Fulfil assigned or implied role
General Characteristics	**Information processing is generally deep** **Student:** - is more professionally orientated - is not text-bound - is an optimiser (that is, is tried to get the most out of study)	**Information processing is generally surface unless otherwise required** **Student:** - is assesssment orientated - is text-bound - is a satisficer (that is, is satisfied with getting by on what is required by assessment)

Reading Material

Essential reading is the first priority of students and this often consists of notes or study guide material. Objectives, in-text questions and assessment activities help them to determine essential reading although some students will not read material unless it is directly relevant to assignments or examination questions.

Students appreciate study guides which are well written and presented. Short summaries at the end of topics or modules are particularly useful to students when they are resuming after a break or absence. The text summaries act as a stimulus but students can also create their own summaries. For this purpose texts with wide blank margins are ideal; double or one and a half line spacing also assists effective note taking. Study guides should explain jargon and obscure terminology. Books of readings should contain clearly printed reproductions and students are critical of blurred, incomplete or miniature copies. Although the return rates of subject evaluation questionnaires are low, feedback from students about the quality of instructional materials should be sought.

Assignments

A combination of various types of assignments - such as those marked by tutors, others marked by computers, survey method, research approach - are all effective. Clear assignment guidelines, especially in relation to marking criteria and standards of presentation, are extremely important. This enables students to carefully select relevant reading materials, especially during the early semesters of a course when their study skills are being refined.

Some assignments require a great deal of time and searching before they can be written and in some instances this is because of weaknesses in the formulation of questions. In other instances students will quickly scan texts and deduce appropriate answers or simply copy from the text. Quick retrieval of answers for time saving reasons certainly does not promote critical and reflective thinking.

Students have expectations about the connections between assessment items, course aims and the structure of study guides. In this sense major assignments should be related to the main components of the text; and course requirements will be satisfied if all set objectives and activities have been attended to.

Regular feedback on assignments is a major way to indicate to students how their study is progressing. Students also tend to compare grades if they have the opportunity. Once assignments are submitted students are extremely keen to receive prompt feedback; comprehensive, detailed feedback is most welcome. Adult students capitalise on positive feedback which they find motivational and if this feedback is on tape it adds another positive, personal dimension.

Student support system

Undertaking studies through the distance education system can be a lonely affair. Family, friends, colleagues and other students may provide support but generally this can only be moral support. Those with no experience of tertiary education cannot provide academic support.

Distance education does not consistently offer face-to-face interaction between students and academics. Interaction occurs on the telephone between lecturer and student and is generally limited in duration, intensity, and by technology. It does not constitute social integration in a campus based community sense. Additionally, student-to-student interaction occurs rarely; hence, there is a deficiency of a student community to which one might become integrated. It is desirable then for academics and distance education administrators to have a general understanding of the social/work contexts of distance education students. Although students learn very quickly about self-motivation, self-discipline and self-reliance, thus fostering a high degree of autonomy, technical help and reassurance are sought from staff members. The availability of staff members coupled with a sympathetic approach would have a positive effect on learning.

Frustration for distance students occurs when the required learning resources, especially textbooks, journals, computers and other materials, are not readily available. Students also experience a rising sense of panic when they are running late with assignment submission or they are unable to locate essential reference texts. In contrast, they feel comfortable when essential reading materials are mailed in advance or when relevant textbooks are available on closed reserve at a local study centre. In fact local study centres and libraries can become intimate friends of students.

Study centres can provide the human element of the distance education system, catering for a variety of students' needs, especially when tutorials or seminars are organised on location. Study centres can be highly valued by students, especially during the orientation period and the early semesters of study, if appropriate information and resources are readily available. Access to computers and availability of relevant reading material are also appreciated. Study centres can be an active meeting place for a variety of purposes and examples include:

- A talk by a visiting lecturer;
- Working through problems, questions and assignments;
- A discussion with the tutor on a predetermined subject; and
- Consultation with the tutor-counsellor, on a group or one-to-one basis.

Study centres on the whole are very worthwhile resources but difficulties may arise because of the proximity of these centres. Frequency of the use of these centres is related to the level of resources and facilities which they offer. The nucleus of student population in the area and the relevance of the centre's program in addressing particular students' study needs and difficulties are also significant factors.

TECHNOLOGY AND INTERACTION

Wyatt (1988) has presented a cumulative list of the various media which are currently utilised in distance education. He states that these technologies are an evolving mix of information and communication media and they include video, telecommunications by satellite transmission and telephone line, computers, and storage devices ranging from CD-ROM to mainframe computers. Specific technologies and techniques are satellite teleconferencing, slow-scan television, computer conferencing, electronic mail, picture phones and video-text.

Administrators, academics and students can be overwhelmed by this technology. Despite the range and complexity of this technology, it does not exist in a vacuum but rather as Wyatt (1988:169) explains 'within a human surround of interlocking factors'. The questions which Wyatt raises and which have implications for continuing professional education are:

- For what purpose is the technology being utilized?
- What social, cultural and communication factors will affect its operation?
- Under what conditions will the technology be used?
- What implications can be drawn regarding the communication characteristics of a media technology system for instructional use?

Technology is clearly more than its hardware and instructional materials. The human element needs to be incorporated, especially interpersonal and nonverbal aspects of communication. Wyatt (1988) has stated that many distance students are in a transition phase of career change or advancement, and their concerns can not be neatly formulated into a question that can be typed into a computer, articulated succinctly over a telephone or presented in a video image. There is a need to study the entire interaction process in distance education.

Interaction denotes some kind of mutual or reciprocal action by which either people or things affect each other and in distance education this may be a very complex phenomenon. It incorporates a variety of activities through printed materials (e.g. study guides), course design team members (e.g. academics, editors), nonprint materials (e.g. audiovisual materials), small groups (e.g. discussion, seminar groups), the personal world of the students (e.g. family and home environments), professional worlds (e.g. peers, members of professional organisations), administrative offices (e.g. departmental secretaries, examination officers, enrolment clerks) and academic support systems (e.g. lecturers, tutors, counsellors). To enhance effective interaction within the context of distance education we need to understand interaction as a multi-faceted phenomenon in which we are engaged all the time and, as Juler (1991:26) puts it:

> its defining characteristic in distance education rests on our innate capacity for such things as reflection and reasoning, questioning and debate. When this capacity finds expression internally or externally we are joining in discourse effectively - we are truly interacting.

Even when the role of the educator is widely defined in terms of facilitation, this still involves talk for most of the time, as Murgatroyd (1989) observes, whether it be on

the telephone or in face-to-face situations. Facilitation, within the context of distance education, broadly means that the student is given, as Bailey (1992:987) describes it, 'structured help in taking more control over her development. This means not only choosing which modules to study in which order but taking responsibility for self-assessment, diagnosing strengths and weaknesses, formulating study plans and using feedback'. The facilitating role of the educator needs to be clarified in the following areas:

- How accessible should a tutor be?
- What role does the tutor have in stimulating self-help groups?
- Where are the counselling boundaries when students experience personal difficulties that impinge on their learning?

The educator needs to be skilled in listening, dialogue and negotiation; skills in the area of guided didactic conversation in which the student develops dialogue through a range of human and technical resources, are equally essential.

CONCLUSIONS

Distance education is now a well established mode of education. It represents a family of strategies within the spectrum of learning opportunities that are relatively open or closed along various dimensions: pace of study, place, level, content, learning style, support assessment and entry qualifications (Lewis & Spencer 1986). The changes and advances that are occurring across the spectrum of distance education practice are at times overwhelming, especially in the technological area; in other areas the developments are of considerable complexity and there is a need for further research and a clarification of issues. The coping strategies of educators, administrators and students need to be particularly addressed and there is at present a great need for continuing professional education.

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RATIONALISATION - A CASE STUDY

'IS BIGGER BETTER?'

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This paper is an evaluation of the modularisation and rationalisation of the first year subject Microbiology in terms of the project aims and questionnaire data obtained from internal and distance students enrolled in the subject in the Spring session, 1993.

BACKGROUND

The modularisation and rationalisation of the teaching of basic microbiology was attempted across both the School of Science and Technology and the School of Agriculture on the Wagga Wagga campus in the Spring Session 1993.

This article is a follow-up paper to an earlier article entitled 'The Modularisation of Microbiology - Prologue', which appeared in *Occasional Papers (14)*.

A core theory module covered eight weeks of the teaching session and introduced basic concepts of microbiology. A practical module was common to all students while specialist modules addressed the needs of major courses. For example, students enrolled in a Wine Science course were given a specialist wine microbiology module while students enrolled in Medical Laboratory Science received a specialist medical microbiology module. In addition, a rationalisation of internal teaching was attempted for the first eight weeks of common lectures, for which all internal students attended common lectures.

THE AIMS OF RATIONALISATION/MODULARISATION OF MICROBIOLOGY

The aims of rationalisation/modularisation were to:

- provide an enhanced learning environment for both internal and distance education students

- create learning environments that are suited to the particular needs of different groups of students
- facilitate revision of modularised subject material
- obtain greater flexibility and reduction in teaching/preparation time for lecturers involved in the teaching of microbiology
- be cost effective in the provision of mail packages for students.

EVALUATION

Method

The modularisation and rationalisation of microbiology was intensively evaluated by designing questionnaires for both internal and distance education students which included both a general subject evaluation and a specific evaluation of each module. In order to improve the return rate, distance education students were provided with stamped addressed envelopes for the return of questionnaires. The response rate for questionnaires specifically designed for this subject was 55% which is significantly higher than the response rate with questionnaires used in many other distance education subjects at CSU.

As well as recording the response from 'Strongly Agree' to 'Strongly Disagree', students were encouraged to give written comments for each question. These comments were subsequently found to be of great value in interpreting results.

RESULTS

Enhanced Learning Environment

Overall, the major restructuring of the subject Microbiology appears to have facilitated student learning due in large part to the modularisation of the subject.

Students found that by breaking down the information into discrete units of study (modules) they could manage their time more effectively (distance education - 97%, internal - 86%). The module profiles were also found useful in focussing student's attention on the most essential information that they needed to study (distance education - 97%, internal - 91%). Comments such as 'It was helpful in pointing out the most important areas to be studied' and 'This part was excellent for revision' typified student responses.

A point worth noting was the degree of satisfaction expressed by internal students receiving the notes for the modules. It is, as yet, not standard practice for internal students to receive the notes sent to distance education students. This raises the issue of equity and equality between distance education and internal students and will need to be addressed in the future.

Meeting Student Needs

Students seemed to benefit particularly from the specialist modules (distance education - 80%, internal - 90%). The specialist modules were prepared for students enrolled in over ten courses including Equine Studies, Medical Laboratory Science, Wine Science, Agriculture, Biotechnology, and Environmental Science. For example, a student enrolled in the Wine Science course would study the Wine Microbiology specialist module as well as the common core theory and practical modules. Students found the specialist modules highly relevant to their particular area of interest, making their study of microbiology more meaningful (distance education - 80%, internal - 87%). The majority of students also felt that they had gained from having different (specialist) lecturers involved in the teaching and writing of the various modules (distance education - 77%, internal - 75%) with comments such as 'Different points of views and a better understanding of topics'. However a minority of students found the changes in writing and lecturing style confusing, e.g. 'The constant changing in lecturer styles and methods was more confusing than the specialist knowledge was helpful'.

Revision of Modularised Subject Material

As a result of the analysis of student questionnaires, revision of each module will be undertaken to further improve the quality of this subject. Modularisation will make this revision easier as individual staff members can now work on discrete parts of the subject.

Greater Flexibility and Reduction in Teaching/Preparation Time

This was envisaged initially as one of the major benefits of rationalisation. However, it soon became apparent that this exercise would not reduce the work load for lecturers or support staff. Through having a rationalised common core module, a saving in lecturing time was achieved through the sharing of the first eight weeks of lectures between two staff (a saving for each of four weeks of lecturing time). However, for the final five weeks of the teaching session, four different lecturers were required for each of the specialist modules. Also the time spent in the initial preparation of teaching material was considerable for both teaching and support staff (ie lecturers, instructional designers and word process operators).

The administrative load generated in the initial preparation of the mail packages, which was hoped would be offset by the time saved through the modularisation/rationalisation process, did not eventuate. For example, the complexity of students requiring different sets of mail package material was only overcome through using a coding system whereby each student was coded by the course in which they were enrolled. This time consuming task will need to be undertaken each year by a lecturer involved with the teaching of this course.

The final examination posed special problems which could only be overcome by providing each student with an examination paper for every module in the subject (six modules in total). Further, administrative processes were not sufficiently sophisticated to

ensure that examiners marking different modules received the student's examination scripts for which they were responsible.

Overall, the greatly increased administrative load for all involved with the subject plus the lack of flexibility created by increased student numbers made the gains in reduction of contact time for lecturers insignficant.

Cost Effectiveness

- Until recently the number of master copies played a large part in the overall cost of the teaching material, ie master copies were costed as separate items (approximately one dollar per plate) and it would therefore have been cheaper to rationalise the teaching materials of two subjects into a common subject. However, using new high speed photocopiers, a base rate of 3 cents per single page is charged for each page copied (including the master copy). Therefore cost savings associated with printing materials due to the rationalisation of subjects is now minimal.

- Difficulties normally associated with class timetabling were exacerbated because of:

  i. The need to schedule a common lecture time for students studying in over ten courses.

  ii. The requirement of the booking of four lecture theatres for each of the specialist modules for the duration of the session. Three of these four lecture theatres were vacant but unavailable for the first eight teaching weeks of the teaching session. The fourth lecture theatre was used for teaching the core module and subsequently for a specialist module later in the session.

  iii. The lack of laboratory space to accommodate large numbers of students. Existing facilities proved inadequate for the exercise, especially in the School of Agriculture with its smaller laboratories.

PROBLEMS PERCEIVED BY STUDENTS

One potential problem area for students was the complexity of the instructions regarding the running of this subject. Much preliminary work was undertaken to ensure that this subject ran smoothly and that the instructions were clearly understood by all students concerned. It was noted with great relief that students both externally and internally clearly understood the instructions concerning the organisation of this subject (distance education - 92%, internal - 81%). Another area of organisation concerning this subject was to ensure that all students received the correct modules that they were studying. Again, this problem was successfully overcome with 96% of all distance education students receiving the correct mail package on time! However, while the modularisation of microbiology was successful, it was with the rationalisation of this subject that difficulties occurred.

Did Students Perceive 'Bigger as Better'?

Satisfaction with the subject overall was higher with the distance education students (83%) than the internal students (65%). This was in a large part due to the problems with rationalisation which affected internal students more than the distance education students as the former had to attend lectures and practical classes on campus.

The internal students found the large numbers attending the common lectures not conducive to the learning and study of microbiology. Only 36% of all students found the lectures worthwhile for the common module. However, students stated very positively that they found lectures worthwhile in the smaller specialist module groups (95%).

Compromises in subject delivery because of the rationalisation of microbiology between the School of Agriculture and the School of Science and Technology sometimes resulted in less than satisfactory outcomes, e.g. one of the compromises (to have fewer assignments and therefore less feedback for students) was not received favourably by the students with 61% of distance education students and 70% of internal students wanting earlier, better and more feedback.

QUALITY CONTROL - PEER APPRAISAL

An unexpected benefit of rationalisation was the staff interaction and subsequent peer appraisal for teaching materials. Teaching materials were subjected to a most intensive and rigorous appraisal which has resulted in improved quality material for both distance education and internal students.

The evaluation of this subject using a questionnaire specific for this subject has resulted in the modification of teaching materials and teaching methods to be used in the following year. Students enrolled in this 'new, improved' version of the subject will also be surveyed to determine if the changes have further improved the quality of the subject. In order to increase the response rate on subject questionnaires students need to receive feedback on the action taken to address shortcomings they perceived in their subjects, e.g. publishing results and proposed action to be taken in *Outpost*, a student newsletter. This quality audit and student feedback to implement ongoing improvements in the teaching/learning environment has proved successful in this subject.

CONCLUSION

The rationalisation/evaluation and subsequent evaluation of microbiology was a worthwhile project which achieved the objective of improving the quality of the subjects. All staff involved in the restructuring and subsequent evaluation of the subjects were forced to reassess critically their objectives and goals for this subject. Student feedback has been used to improve and enhance the delivery of this subject for the future.

However, one of the premises of rationalisation - that 'bigger is better' - did not apply in this case study. Students and lecturers alike preferred a smaller, tailor-made, more

individualised subject. This case study will hopefully promote more discussion concerning the advantages and disadvantages of rationalisation.

LITERATURE REVIEW RELATED TO STYLE ISSUES

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This paper reviews the literature which examines how specific layout features can be used to enhance learning in distance and open learning materials.

INTRODUCTION

This review considers matters relating to the features of instructional material and their influence on learning.

According to the educational theorists Gagne and Briggs (1979), the following nine instructional activities are required in order for learning to take place:

1 **gain attention** by directing students to the topic at hand;

2 **inform learners of the objective** by making them aware of the instructional goals so that students may acquire the necessary 'mind set';

3 **stimulate recall** of prior learning;

4 **present stimuli** with distinctive features that are inherent to the learning task;

5 **guide learning** in order to reduce the occurrence of irrelevant 'hypotheses' and thereby increase the efficiency of learning;

6 **elicit performance** by directing students to perform activities that give them an opportunity to practise and apply newly acquired skills;

7 **provide formative feedback** that reassures the students, suggest remedial action to improve their weaknesses, and give them an opportunity to go beyond the immediate situation;

8 **enhance retention** and learning transfer to new situations;

9 **assess performance** or provide a summative evaluation of the students' progress.

Distance educators have been influenced by such principles, but whilst they agree on the need for structural features such as tables of contents, introductions, advance organisers and so on to be included in order to facilitate the teaching strategies outlined above (Wright & Conroy, 1988), the question remains of how to use desktop publishing techniques to maximise their effectiveness.

Both Hartley (1985) and Misanchuk (1992) take the physical limitations of the process into account first : the size of the page governs the layout, the frequency of revision of the materials affects how complex the work can be, the size of the print run affects the type of binding and covers, and the expertise of the computer operator influences the quality of the end product.

While there are many styles that have been used in educational materials, there is still much dispute as to what constitutes an educationally sound layout. Misanchuk (1992) views desktop publishing for instruction (DTPI) as different from other desktop publishing (DTP). DTP is often concerned with 'selling' something; DTPI is more concerned with getting an educational message across. He claims (22-23):

> Instructional materials typically make more frequent use of the following devices than do most other text materials:
>
> - 'point form' or numbered points;
> - notes of explanation (e.g., footnotes or end-notes);
> - examples which are often set out from the surrounding text in a special way, to make them easier to identify;
> - embedded questions;
> - graphic elements used as cuing devices (e.g. using boldface type to highlight new vocabulary, or using various symbols or icons to identify important points;
> - learner interactivity (e.g. blanks to be filled in; multiple choice responses to be selected).

In the brief literature review below I consider what some writers have said about specific layout features, including columns, text justification, headings, and icons, and their uses in distance education materials.

COLUMNS

According to Hartley (1985), Misanchuk (1992), and Rowntree (1990), single column design work is generally recommended for instructional text, provided the line length is neither too long nor too short for readers.

Misanchuk argues that the width of the text column should be perceptibly narrower than the page. Like others (Shushan & Wright, 1989; West, 1987) he advises that the white space be on the left of the text. The blank space in the margin can be used for side headings, pull quotes, illustrations, icons, or other forms of marginalia. 'Even if these features are not built into the design, the so-called 'wasted' space engendered by the wide margin is not really wasted. Learners may use it to make notes for themselves' (Misanchuk, 88).

JUSTIFICATION OF TEXT

Arguments strongly in favour of right ragged text include:

- legibility is maximised when letter spacing and word spacing are kept constant (Spiegelman, 1987);
- right ragged margins help make the document look less formal and are valuable when the text is liable to be revised frequently (Davis *et al*, 1986);
- right ragged text is easier to read, and helps avoid the 'rivers of white' problem that invariably crops up with fully justified text (Kleper, 1987).

PAGINATION

Traditionally preliminary pages (e.g. title page, copyright notice, table of contents, list of illustrations, preface or introduction etc.) are numbered in lower case Roman numerals whereas the remainder of the book is numbered in Arabic numerals. According to Misanchuk (1990: 98), from the point of view of optimising access structure, these practices appear adequate. According to the AGPS (1988: 226)

> **14,46** Folios bearing arabic numerals are counted from the first page of chapter 1 or from the part-one title page if there is one. The preliminary pages are counted from the half-title ... The preliminary pages are numbered separately from the text in order to allow material in that part of the book to be inserted, deleted, expanded or contracted without affecting the text pagination.

HEADINGS

- attract readers' attention
- make the subject matter readily accessible
- indicate relative importance of items
- make plain the structure of knowledge being taught.

Learners do not necessarily know intuitively how to use headings (Hartley & Jonassen, 1985). For that reason Misanchuk (1992: 102) recommends that an explanation of the heading system and how it relates to the structure of the content should be included early in the instructional materials.

He also recommends that wherever possible, the number of heading levels should be kept to 3 or fewer, as do Lang (1987), Miles (1987), and Rowntree, (1990).

VISUAL CUING

> Visual cues of various kinds can be built into instructional materials to help the learner. Sometimes certain words or passages of text are set in boldface or italic type; other times dingbats or icons may be used to designate certain kinds of activities ... On the basis of several research studies, Hartley & Burnhill (1977b) concluded that typographic cuing is likely to have little effect unless the learner is specifically informed of the function of the cuing, and instructed on how to deal with it.
>
> (Misanchuk, 1992: 113).

It is widely recommended that a serif font be used for body text for instructional materials, and that, in general, sans-serif font be reserved for headings.

Based on the AGPS style manual and Misanchuk (1992: 146), italics should be used for:

- introducing a technical or key term - the first time only
- titles of books, journals, films etc.
- specialised applications (e.g. species)
- identifying foreign words or phrases not common in English

Bold type should be used for emphasis of words or short phrases, but not sentences or long phrases. (As any eye catching device, it should not be over-used or it will lose its effectiveness).

ICONS AS ORIENTING DEVICES

> Icons are pictorial or graphic signs that possess the properties of an object, or an idea that they represent. In the context of instructional materials, icons could be graphic representations of various learning activites. They can be included in instructional materials primarily to act as what Waller calls "orienting" devices, part of the access structure of the document (Waller, 1977: 1982). In other words, they act as highly visible reference points, or sign posts, indicating the location of certain kinds of material.
>
> Icons used in instructional materials should always be explained in the introduction to the materials. Obviously their use should be consistent within a given package of materials (i.e. a given icon should mean the same thing across different portions of the instructional package); it is highly desirable that the icons be given at least approximately the same meaning across different packages of instructional materials, as well.
>
> (Misanchuk, 1992: 115)

Rowntree (1990: 175) supports the use of icons asserting that symbols in the margin are often a useful means of alerting readers to the kind of material that lies ahead. He says that it doesn't matter what symbols are used, so long as they are visually distinct from one another and are understood by the reader. In the age of icon-driven computer programs there is increasing familiarity with this approach. Certainly the literature on computer use suggests that icons are a powerful form of shorthand. However, as Misanchuk also points out, it is important that discretion be used and that the number of visual signposts used be limited. The following figure shows some examples of icons and suggested meanings.

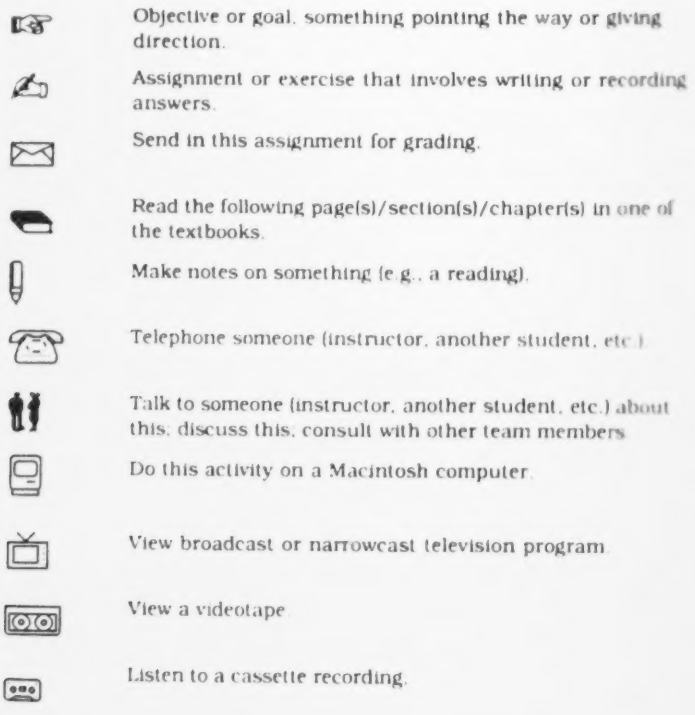
Objective or goal, something pointing the way or giving direction.
Assignment or exercise that involves writing or recording answers.
Send in this assignment for grading.
Read the following page(s)/section(s)/chapter(s) in one of the textbooks.
Make notes on something (e.g., a reading).
Telephone someone (instructor, another student, etc.)
Talk to someone (instructor, another student, etc.) about this; discuss this; consult with other team members
Do this activity on a Macintosh computer.
View broadcast or narrowcast television program
View a videotape
Listen to a cassette recording.

Figure 1 Some icons that could be used with instructional materials, and suggested meanings.

Source: Misanchuk,1992: 116

BORDERS AND BOXES

The distinction between borders and boxes apparently varies from one author to the next. Borders and boxes both separate some elements on the page from other elements.

Lichty (1989:127) claims that borders can be used to:

- separate a part of the text from the remainder for emphasis
- provide some typographical color to an otherwise gray page
- break text into smaller, more appealing groupings
- provide an appropriate border for line art or photographs.

> There seems to be no research on the effects, if any, that borders and boxes have on instruction, but prudence seems to suggest that if borders are used, simple designs should be chosen, and they should be used with restraint so as not to overwhelm the learner. Boxes can be used to separate text within them from other text on the page, and can be effective for highlighting important points or setting off distinctly different material
>
> (Misanchuk, 1992: 268).

Rowntree (1990, 297) also feels that rules and borders are useful typographic devices that can be used to enclose figures and to box certain kinds of recurring text. Similarly Race (1992: 134) sees boxes being useful for many purposes including emphasising or separating:

- learning objectives
- key information
- asides, case studies
- worked examples.

VARIETY OF STIMULUS

Perhaps the final thought can be best expressed by Rowntree who exhorts the designer of instructional materials to make the format interesting for the learner.

> Learning at a distance can be boring. Learners working on their own, deprived of the stimulus of interacting with other people, may well think print a cold and dreary substitute. To some extent, your use of activities should help avoid the tedium of "one damn paragraph after another". But you can do more. Bear in mind the potential loneliness of the long-distance learner. Build variety into your lessons.
>
> Try to avoid offering page after page of solid print. Think of your text as a number of "double page spreads". Aim to make each one visually distinct from others. Vary your format. This will refresh your learners with a new image each time they turn the page. The visual uniqueness of each spread will itself help many readers to learn and remember.
>
> (Rowntree, 1990, 152)

CONCLUSION

Although many distance educators consider the use of particular style issue as a matter of personal choice, there does seem to be a body of research evidence which should be consulted. This paper reviews some of this evidence.

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